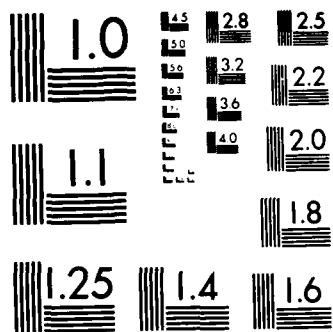


INSTRUCTION SYSTEMS FOR USMC PROFESSIONAL MILITARY  
EDUCATION EXPLORATORY (U) HUMAN RESOURCES RESEARCH  
ORGANIZATION ALEXANDRIA VA J N JOYNER ET AL SEP 84  
HUMRRO-FR-PRD(CA)-84-12 N00123-80-C-0847 F/G 5/9

NL

UNCLASSIFIED

HUMPRO-FR-PRD(CA)-84-12 N00123-80-C-0847 F/G 5/9



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

AD-A174 897

HumRRO FR-PRD(CA)-84-12

Instruction Systems for  
USMC Professional Military Education:  
Exploratory Development

John N. Joyner  
Robert Vineberg  
Gregory A. Davis  
Ray A. Zimmerman

September, 1984

Prepared for  
Navy Personnel Research and Development Center  
San Diego, California 92152

DTIC  
ELECTE  
DEC 09 1986  
S D

**DISTRIBUTION STATEMENT A**

**Approved for public release;  
Distribution Unlimited**

HumRRO  
1100 South Washington Street  
Alexandria, Virginia 22314

MMC FILE COPY

86 12 08 040

## REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT		
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE			Approved for public release; distribution is unlimited.		
4. PERFORMING ORGANIZATION REPORT NUMBER(S) HumRRO FR-PRD(CA)-84-12			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION Human Resources Research Organization		6b. OFFICE SYMBOL (If applicable)		7a. NAME OF MONITORING ORGANIZATION Navy Personnel Research & Development Center	
6c. ADDRESS (City, State, and ZIP Code) 1100 South Washington Street Alexandria, VA 22314		7b. ADDRESS (City, State, and ZIP Code) San Diego, CA 92152-6800			
8a. NAME OF FUNDING / SPONSORING ORGANIZATION Education Center, Marine Corps Development & Education Center		8b. OFFICE SYMBOL (If applicable)		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER Contract N00123-80-C-0847	
8c. ADDRESS (City, State, and ZIP Code) Quantico, VA 22134		10. SOURCE OF FUNDING NUMBERS			
		PROGRAM ELEMENT NO 62763N		PROJECT NO F63521	
		TASK NO CF63521080		WORK UNIT ACCESSION NO 006-03.06A	
11. TITLE (Include Security Classification) INSTRUCTION SYSTEMS FOR USMC PROFESSIONAL MILITARY EDUCATION: EXPLORATORY DEVELOPMENT					
12. PERSONAL AUTHOR(S) Joyner, J.N.; Vineberg, R.; Davis, G.A.; and Zimmerman, R.A.					
13a. TYPE OF REPORT Final		13b. TIME COVERED FROM 3/80 TO 8/84		14. DATE OF REPORT (Year, Month, Day) 1984, September	
15. PAGE COUNT 59					
16. SUPPLEMENTARY NOTATION Related reports are NPRDC Special Reports 83-19 (AD-A126 455) and 83-45.					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Professional military education (PME), nonresident training, nonresident officer training, individualized instruction, teleconferencing.		
05	09				
19. ABSTRACT (Continue on reverse if necessary and identify by block number) Phases I and II of this effort to increase the efficiency and effectiveness of Marine Corps professional military education (PME) addressed resident PME; and Phase III, nonresident PME. An individualized instruction and evaluation system implemented in Phase I at the Instructional and Management school trained students faster and more effectively than the previous lock-step course. Evaluation of an individualized portion of a subcourse at the Command Staff College in Phase II suggests that the quality of the instructional segment may affect students more than the presentation mode. Phase III compared several delivery media for nonresident PME and tested one medium, teleconferencing. The official participants reacted favorably to teleconferencing, considered it to be a good instructional technique, liked its ability to bring diverse groups together without having to travel to a central location, but preferred the interactions possible in a face-to-face group discussion.					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION		
22a. NAME OF RESPONSIBLE INDIVIDUAL Dr. Carol Ann Robinson			22b. TELEPHONE (Include Area Code) (619) 225-6434		22c. OFFICE SYMBOL 51

30. What were some of the strong points of this teleconference, compared to other instructional methods or media?

31. What were some of the weak points of this teleconference, compared to other instructional methods or media?

32. What are your suggestions for improving this teleconference?

33. In what occupational specialty are you currently serving?

## PREFACE

This report describes exploratory development work conducted in the area of Marine Corps professional military education (PME) from March, 1980, to August, 1984. The research was monitored by the Navy Personnel Research and Development Center and sponsored by the Education Center, Marine Corps Development and Education Command (MCDEC) at Quantico, Virginia, and Headquarters, Marine Corps. The project was initiated as the result of FY1980 proposed exploratory development efforts that specified a need for (1) new alternatives to traditional group-paced instructional programs for resident Marine Corps PME and (2) new strategies in nonresident courses that would improve student motivation, interaction with peers and instructors, and instructional feedback.

The contracting officer's technical representatives were Drs. Kathleen A. Lockhart, Michael R. Flaningam, and Carol A. Robinson. Appreciation is due Mr. William Greenup, Instructional Management Department, MCDEC, and to the Marine Corps Institute, Washington, D.C., for support, materials, and assistance through the life of the project. Special thanks are also due the Amphibious Instruction Department at Quantico for a superb presentation of the teleconference class on fire support coordination.

This report is the deliverable for Tasks 7 and 8 of Contract N00123 80-C-0847: Individualized Systems for Marine Corps Professional Education.

## TABLE OF CONTENTS

	<u>Page No.</u>
PREFACE	
INTRODUCTION	1
Background	1
Project PME	3
PHASE I	3
The Meaning of Individualized Instruction	4
Individualization at the Instructional Management School	5
Handbook for Individualized Instruction	7
PHASE II	8
Background	8
Plan for Individualizaiton	9
Ship-to-Shore Workbook	10
PHASE III	12
Background	12
Approach	13
Results	26
Conclusion	29
Recommendations	29
APPENDIX A - Letter to Students Soliciting Participation	
APPENDIX B - Instructor's Teleconference Agenda and Script	
APPENDIX C - Students' Teleconference Information Sheet	
APPENDIX D - Distribution of Questionnaire Responses	
Figure 1 - Lesson Structure	6

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	



## INTRODUCTION

### Background

The Education Center of the Marine Corps Development and Education Command (MCDEC) provides resident professional military education (PME) to officers and staff noncommissioned officers, through five programs: the Basic School, the Communication Officers School, the Amphibious Warfare School, the Command and Staff College, and the Staff NCO Academy. MCDEC also provides PME to nonresident students, through the Marine Corps Institute, Washington, D.C. The majority of Marine Corps officers and SNCOs depend on nonresident instruction for most of their professional education; the resident schools can accommodate only about one-fifth of personnel from SNCO to lieutenant colonel.

The group-paced lecture mode of instruction, which is predominantly used for the resident programs, precludes the maximum use of resources. Students must wait for classes to convene rather than begin coursework upon assignment to a school. Some of the longer courses can be offered just once a year in the group-paced mode, thus limiting access by prospective students. Some students in a course may find there is too little time to accomplish course objectives, while others find there is too much time, especially if the course is relatively simple or repeats material the student has already studied.



One goal of the effort reported here was to respond to the Marine Corps requirement to increase the instructional effectiveness of its PME programs while achieving greater efficiency in their generation and delivery. The effort was based, in part, on the hypothesis that the efficiency of selected resident instruction can be increased by instituting individualized instruction. There have been numerous efforts in recent years to apply individualized instruction to formal military courses. The publication of the Navy's Interservice Procedures for Instructional Systems Development (NAVEDTRA 106A) and other documents such as the Marine Corps' Instructional Systems Development (MCO-P1510-23) have contributed to the implementation of this process. However, many instructors have found it difficult to implement individualized instruction while meeting their other instructional commitments. Further, most of the applications of individualized instruction in the military have been to technical training courses; very little has been done for training that is as heavily knowledge-based and cognitive in nature as PME.

Another concern to be addressed was that there was no opportunity for nonresident PME students to participate in seminars and thus interact professionally with their instructors and peers. This lack of professional contact in nonresident training was felt to be particularly important because joint decision making and group problem solving are some of the skills to be fostered by professional military education. The opportunity to participate in seminars, in fact, was often cited as one of the chief merits of resident training. It is generally considered that the effectiveness

of the professional education programs would be enhanced if a method were found to "export" to nonresident students the advantages of the seminar experience. The question had also been raised whether nonresident instruction might be more effective if the current medium of instruction--workbooks--was augmented by a more modern medium or combination of media.

### Project PME

In response to these needs, under the sponsorship of the Education Center at Quantico and HQ Marine Corps, the USMC Professional Military Education Project was undertaken by the Navy Personnel Research and Development Center (NPRDC) in San Diego, with the Human Resources Research Organization as contractor. The PME project consisted of three phases, comprising five activities, spanning the period from March of 1980 to August of 1984. Phases I and II were concerned with individualized instruction systems for resident training, and Phase III with utilizing audiovisual media in nonresident PME.

### PHASE I

Phase I was concerned with (1) introducing a more individualized system of instruction at an instructor training course and (2) developing a handbook to guide instructors and instruction managers in individualizing their own courses. Some definition of the term individualized is in order before these activities are discussed.

## The Meaning of Individualized Instruction

Individualized instruction means different things to different people in the field of training and education. In the PME project, the term simply means making instruction more effective by being responsive to differences in students' traits and knowledge. It is important to keep this definition in mind for at least two reasons.

First, individualization of instruction is often confused with self-pacing (one method of individualizing instruction), Instructional System Development (a set of procedures for developing instruction), the use of audiovisual media (a technique for presenting any instruction), and even the abolition of instructors (a practice the authors consider unlikely to improve instruction).

Second, professional military education, like other career development training, is conducted in a more collegial atmosphere than that of typical entry-level, mass-administered military training. In courses like those at the Command and Staff College, which run many months, there already exist both the intention and the opportunity for instructors to become acquainted with students' traits and needs and to respond accordingly. The problem was not that the conventional resident PME program inherently lacked individualized treatment of students, but rather that relatively little information was formally, intentionally, and systematically collected concerning students' progress. This situation is not a cause for alarm (it is probably close to the norm for college-level and post-graduate education)

but is mentioned only to point out the obvious -- that being more deliberate and more systematic in the pursuit of instructional effectiveness is more likely to achieve it.

### Individualization at the Instructional Management School

The first activity of the PME project was to implement a more individualized system of instruction at the Instructional Management School (IMS) at Quantico. One purpose of the individualized system was to serve as a model for the individualization of other PME courses.

Personnel assigned as instructors at any of the PME schools at Quantico are generally required to complete an instructor training course at IMS prior to or soon after assuming their instructional duties. The word management in the school's name reflects the trend of recent years toward emphasizing the systematic development of instruction. Students at IMS are taught not only how to present themselves effectively in front of a class, but also how to write instructional objectives, select methods and media for instruction, and perform the other activities collectively known as ISD (Instructional Systems Development) or, more recently, SAT (Systems Approach to Training). IMS, in fact, was a principal standard-bearer for The systems approach both at the Quantico PME schools and within the Marine Corps generally.

The individualization of the Instructional Management School (IMS) is described in NPEDC Special Report 83-19 (Flaningam and Joyner, 1983) and will only be summarized here. The activity began with a visit to the



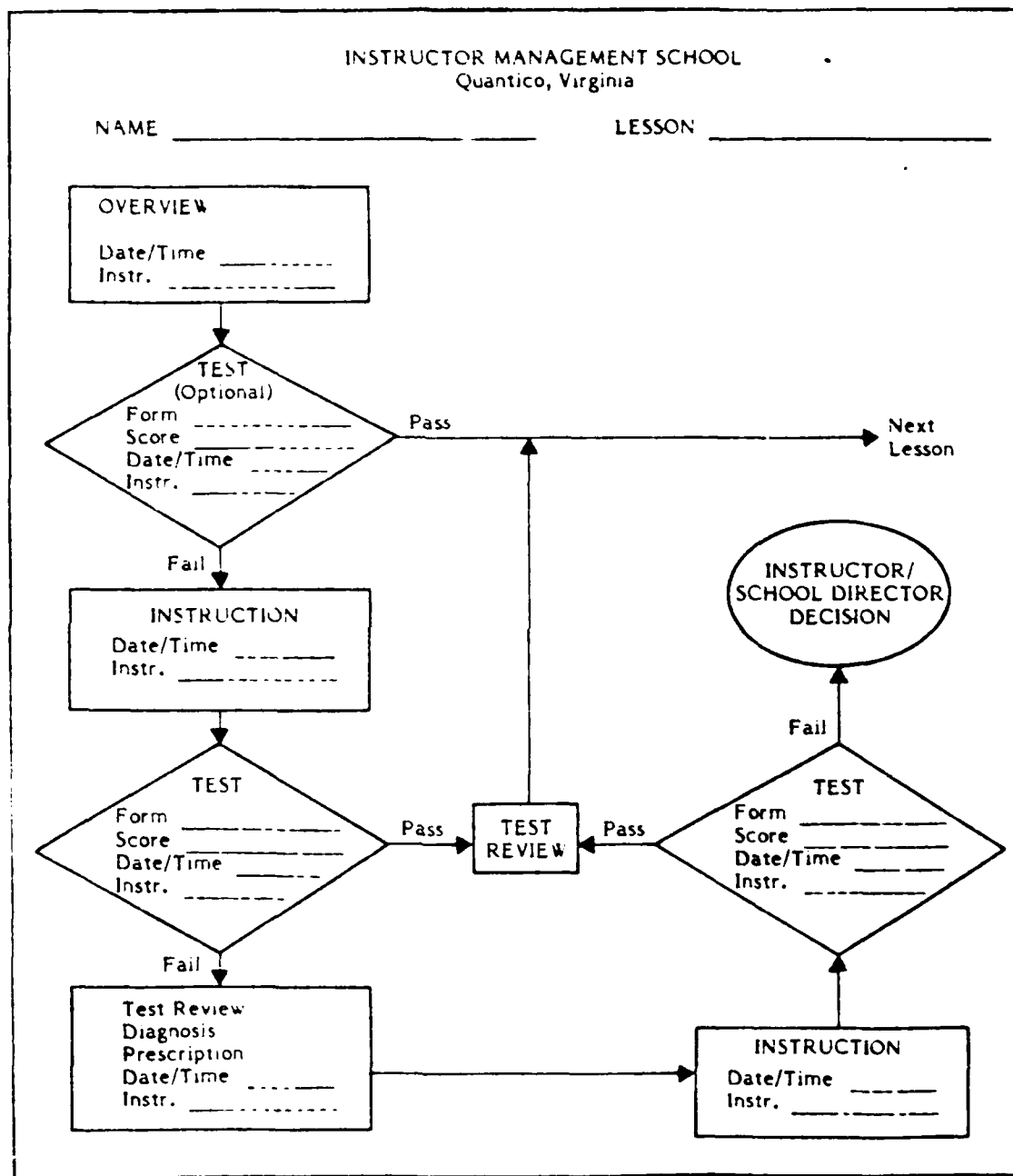


Figure 1. Lesson structure.

the IMS averaged 14 days, including days absent for medical or other reasons, about one week less than the previous lock-step version of the course. Informal feedback from the schools to which the IMS graduates were assigned as instructors indicated that attendees at the individualized course were at least as well qualified as attendees of the conventional course.

#### Handbook for Individualized Instruction

The second activity of the PME project was the development of a Handbook for Individualized Instruction to assist instructors and instruction managers in using individualized instruction in their own courses. The handbook was based largely on the experience and techniques gained from the implementation at IMS. It is directed at trainers who are already familiar with current Marine Corps directives for developing instruction and who have completed an instructor training course.

The handbook is composed of three main parts: (1) a "Study Guide," (2) tests, and (3) "Course Forms" for instructors' use. A short paragraph introducing each chapter and a set of study questions for each chapter comprise the 51-page study guide. There are two 50-item tests with answer keys, and several course forms for instructors to use or modify to monitor and evaluate students' progress in their own courses.

The handbook contains a discussion of individualization in terms of four variables: content, time, method, and achievement level. It is based on a model of instruction in which one or more of these dimensions varies

under control of the instructional system or as a consequence of varying another dimension. The instruction system implemented at IMS, for example, is categorized in the handbook as "variable content, variable time, fixed method, fixed achievement level". Content at IMS is variable, because, although most students follow the instructor "track," some students study only one aspect of the curriculum, such as task analysis. Time is variable, because each student progresses through the course at his or her own pace, moving to the next lesson only after passing a test on the previous one. Method and achievement level are fixed, because all students learn from workbooks and individual help from instructors and all must reach the same level of mastery in order to proceed to the next lesson.

The role of evaluation in an individualized system is stressed; the handbook points out that an individualized system needs more information about students' performance, in order to respond to differences in students' traits and knowledge. The handbook was published as an appendix to NPRDC Special Report 83-45 (Joyner, Vineberg, and Flaningam, 1983).

## PHASE II

Phase II of the PME project was concerned with individualization at the Command and Staff College at Quantico.

### Background

The Command and Staff College (CSC) curriculum is designed to prepare



mid-career officers for staff and command positions. Students, nearly all holding the rank of major, come not only from the Marine Corps, but also from other services and foreign countries. A central aspect of the Marine Corps mission is the amphibious capability, which requires coordination between air, sea, and land units. Many officers enter CSC from career fields, such as aviation and logistics, in which they may have had limited experience with amphibious operations. Since students enter CSC from such diverse backgrounds, it has been thought necessary to spend a few days reviewing and demonstrating the doctrinal fundamentals of amphibious planning and the authority relationship between commanders of air, sea, and land units. The Introduction to Amphibious Operations subcourse serves that purpose. The subcourse is presented in a 17-hour unit by lecture and by demonstration on a large terrain model.

Included in the 17 hours is an individually-graded written test that samples the content of the lectures and the doctrinal references, principally LFM 01, Doctrine for Amphibious Operations, a joint-service publication. Part of the purpose of the subcourse is to provide a base of information, in the form of familiarity with such doctrinal publications, to which students can refer for the remainder of their time at CSC.

However, despite the apparent need for such a subcourse, however, it was reported by instructors that many students felt they were already familiar with amphibious doctrine. At the same time, instructors reported that students made errors in subsequent exercises that could be traced back to lack of knowledge of amphibious doctrine. The instructors felt that the subcourse was needed, but that an individualized presentation

might be superior to the current 17 hours of group-paced lecture/demonstrations.

#### Plan for Individualization

It was proposed to implement individualization at CSC by developing instructional packages to replace the existing lecture/demonstrations. Existing portions of the subcourse devoted to demonstrations on the terrain model were to be retained, revised only as necessary to match changes in the remainder of the subcourse. Each lesson package was to consist of (1) the printed materials in which amphibious doctrine is explained, (2) a study guide to tell students what to read for each lesson and (3) a set of study questions for each lesson. For each lesson, a test was to be developed in three alternate forms. The test items were to be similar to the study questions and to cover the same content.

The subcourse was projected to last 16 hours. The first eight hours were to be devoted to self-paced study. Students would work their way individually through the lessons, taking end-of-lesson tests at the completion of each. Each student would be assigned to a study group, with an assistant instructor assigned to each group as a guide, to be available full-time to answer questions and give tests. Students who failed a test would be retested after a waiting period.

At about the 9th instruction hour, a demonstration of amphibious planning would be given on the terrain model, lasting approximately four hours. The remaining four hours of the subcourse would be spent back in study

groups.

### Ship-to-Shore Workbook

A change in personnel at the Command and Staff College occurred between the planning stage and the implementation stage of the individualized program, and the proposed system was not instituted. In order to take advantage of some of the preparation already made and to familiarize CSC personnel with the individualized concept to the extent possible within new constraints, it was decided that a self-paced text should be developed to treat one part of the CSC subcourse on amphibious operations. The portion selected was the ship-to-shore movement phase of the amphibious assault. With the assistance and support of the CSC instructor for the subcourse, an eight-chapter, 135-page text was written that included 149 study questions. An additional 17-page answer key was also included.

Two hours of course time were allocated to this lesson, and the instructor informed students in the written memorandum on the subcourse that they should expect to spend a total of four to five hours completing and reviewing the text and its questions prior to the test on amphibious operations. Of the 100 questions on the multiple-choice subcourse test, 35 were on ship-to-shore planning, nearly all of them selected from the ship-to-shore text. The test was completed by 156 students.

The Command and Staff College solicited signed, free-response comments regarding the ship-to-shore text from a small sample of eight students.

Three of the eight volunteered that the text had required more time to complete than the estimate of four to five hours agreed upon by the contractor and the CSC instructor. The comments tended to stress that the text was well organized (four students) but that the chapters dealing with planning tables should be better organized and/or consolidated (three students).

There was no indication in the comments from students of a positive or negative response to the self-paced, study-guide method of instruction per se. This is not surprising, given the wide variance in effectiveness within any method. It is fair to say that the sample of respondents responded positively to the self-paced text, but a larger sample of students also responded positively toward the lecture/demonstration portion of the same subcourse. It may well be that students are more affected by the quality of a given instructional segment as by whether the segment is presented in any particular mode, such as lock-step or self-paced.

### PHASE III

Phase III was a relatively separate and distinct part of the PME project, dealing not with individualized instruction in general, but specifically with the medium of instruction -- the instruction "delivery system." In addition to the Education Center at Quantico, the Marine Corps Institute (MCI) at Marine Barracks, Washington, D. C., was involved in supporting this phase. The MCI has for many years developed, distributed, and graded correspondence course materials for enlisted specialties in the Marine Corps. In the late 1970s, the MCI became responsible for the conduct of

nonresident PME courses as well, which had formerly been administered by an extension school at Quantico.

### Background

Because the majority of Marine Corps officers and Staff NCOs depend on nonresident instruction for most of their professional education, it is clearly of special importance that the most effective means be used for transmitting, or "exporting," nonresident instruction. As already noted in this report, a matter of special concern is that nonresident PME students have no opportunity to participate in seminars and thus interact professionally with their instructors and peers. The purpose of Phase III of this project was to select and test at least one instruction medium for augmenting the workbook/texts now serving as the sole medium for nonresident PME instruction, and it was hoped that the medium selected would be capable of conveying the essential attributes of the seminars to nonresidents.

### Approach

The general approach employed in Phase III comprised four steps: (1) the comparison of alternate media for nonresident PME, (2) the selection of one medium for testing, (3) the conduct of a segment of nonresident instruction using the chosen medium, and (4) the evaluation of the results.

The comparison of media was accomplished by the contractor in a report prepared for NPRDC. At a meeting of representatives from MCDEC, NPRDC,

the MCL and Marine Corps Headquarters, the teleconference medium was chosen from among those reviewed. A teleconference was held in May of 1984 between an instructor at Quantico and 22 active-duty officers and 1 reserve officer who were all graduates of the nonresident Amphibious Warfare course. The principal means of evaluation was a questionnaire mailed immediately after the teleconference to all participants.

#### Step 1. Comparison of Media

From a range of 94 currently available instruction media, the contractor identified 12 as feasible, appropriate, and potentially economical for exporting instruction to PME students:

- One-way transmitted live audio (telelecture)
- Two-way transmitted live audio (teleconference)
- Transmitted audio tape ("phone-access" audio)
- On-site audio tape
- On-site videotape
- On-site videodisc
- Transmitted computer with graphics (via modem and telephone)
- On-site computer with graphics
- Transmitted text-only computer
- On-site text-only computer
- Tape/slide
- Filmstrip with taped audio ("Cue/See")

These were described and compared in a report (Joyner and Sharon, 1983). The report differed from the work of Braby, Henry, Parrish, and Swope (1975), who compared media primarily in terms of their capacity to represent the stimulus requirements of given instructional events, as it compared media in terms of broad categories of stimulus (visual representations, motion, and sound), other instruction variables (such as feedback capability and branching capability), ease of use, and cost.

One medium that was not among the 12 selected for comparison is worth special mention, because it has generated considerable interest in the military training field for some time: video teleconference. For some time, large business and nonprofit organizations have used the medium of one-way (and occasionally two-way) television transmission to reach large audiences for special events. It is natural for trainers to think about using this medium for reaching nonresident students, given the ubiquity of the television set.

A characteristic of a television signal that is not always obvious, however, is that its wider "bandwidth" prevents its being transmitted over a telephone line, despite the outward similarities between having a home connected to the telephone network and being supplied with cable television.

In the simplest way of visualizing this problem, it would be necessary to string television cables from the sending site (such as Quantico) to every home or office in which the target nonresident students were to receive instruction -- an expensive proposition.

In practice, any attempt to reach several dozen nonresidents students at one time would probably utilize satellite transmission, as the cost of equipping each home or office with a portable antenna would be less perhaps than leasing cable lines for the same purpose. However, satellite transmission costs hundreds of dollars per hour, and receiving antennas can cost over a thousand dollars per site. In the future, it seems likely that nearly all homes and offices will be connected by cables or fiber-optic lines capable of video transmission, just as we are all connected to each other today through the telephone network. If this occurs, it will then be just as feasible to conduct a video teleconference as it is an audio teleconference. At the moment, however, the high cost of video transmission makes video teleconference a medium of instruction suitable for reaching groups, but not geographically dispersed individuals.

The report on media selection contained three different reasons for introducing a new audiovisual medium into nonresident instruction, and each medium was independently compared in terms of these purposes: (1) to permit professional interaction, (2) to permit greater control over the process of instruction, and (3) to provide motion and sound.

It was noted that these goals are not necessarily complementary and that therefore a decision as to which goal should be addressed should precede the decision of which medium should be introduced. The report also stated the assumption that any audiovisual medium used in nonresident PME would be thoroughly supported by the current medium, print, because it was believed to be inefficient to attempt to place all of the instructional prose contained



in existing texts into an audiovisual format.

The export media report was distributed to the interested parties to the PME project: the Education Center Instructional Management Department, Marine Corps Institute, Marine Corps Headquarters Code F (Training), and the Supporting Arms Division of the Amphibious Instruction Department of the Education Center. The Supporting Arms Division could be an interested party because fire support coordination had been previously selected as the subject matter for whatever medium was selected for the test. This subject had been identified by Marine Corps planners as a particularly important one to be stressed in training.

Fire support coordination is defined as the integrated employment of air, artillery, and naval gunfire in support of the commander's scheme of maneuver. In the fire support coordination centers of Marine infantry battalions, regiments, and higher units, a fire support coordinator (generally an artillery commander) monitors the requests for supporting fires sent by ground units, checks whether the requested fire is consistent with a variety of fire support coordination criteria, and intervenes to alter the fire as necessary. The simplest and most common fire support coordination measure is perhaps the unit boundary fire rule. Under this rule, a unit is not permitted to fire into another unit's zone without coordination with and approval of the commander of the other unit.

#### Step 2. Selection of Medium

A meeting was held in Quantico, April 28, 1983, to select a medium for the test. Present were representatives of the interested parties mentioned above, plus the contractor and the Contracting Officer's Technical Representative from NPRDC. Discussion began in the morning and concluded in mid-afternoon. Agreement was reached that the medium to be tested should be two-way audio (teleconferencing) and that the goal being sought was to bring to the nonresident student the advantages of the resident seminars. Teleconferencing was selected only after other possibilities had been discussed at some length and rejected.

In the end, it was agreed that "the driving force should be:

Which objectives in current training [using the printed texts] lend themselves to media other than print?"

The specific application of this concept was to (1) present fire support problems to nonresident students in the current mode, print, then (2) "hold a teleconference to discuss solutions," as is done in the resident programs at Command and Staff College and Amphibious Warfare School.

### Step 3. Conduct Nonresident Instruction by Teleconference

Selection of students. Two nonresident programs teach fire support coordination, the Command and Staff College and the Amphibious Warfare School (AWS). The latter program has a much higher enrollment of Marine officers (about 1700) and was therefore chosen as the more promising place

to seek participants for the teleconference. Based on a draft submitted by the contractor, the Marine Corps Institute distributed a letter (see Appendix A) to 150 graduates of AWS, located at nine East Coast commands, which solicited their participation in the teleconference. The major sites in terms of potential participants were Camp Lejeune, North Carolina; Pensacola, Florida; Cherry Point, North Carolina; and Quantico, Virginia. Graduates of nonresident AWS were sought as participants rather than currently enrolled students primarily to ensure that participants would have completed the fire support coordination subcourse successfully, and to forestall any concern that participation in the teleconference would adversely affect an enrollee's standing in the course.

Thirty-two officers responded positively to the solicitation letter. The contractor contacted each of these by telephone and letter to confirm their availability and interest. For reasons unrelated to the teleconference test itself, several months passed between the initial contact with the pool of participants and the final arrangements for the teleconference. During this time, the pool was reduced from 32 to 21.

The principal cause of nonparticipation was transfer to another unit, which made it very difficult to follow up on the officer's initial interest. Attrition on account of transfer is probably unavoidable to some extent, but would presumably be reduced if the time between initial contact and the teleconference were minimized. In the week before the teleconference was held, one of the officers at Quantico reported that three members of his unit also wished to participate, so the scheduled number of participants

was established at 24. During the teleconference itself, one officer did not come "on line." He was contacted during the week after the teleconference and explained that his superior, a general officer, had requested his presence on short notice, during the teleconference. All of the other 23 scheduled participants reported in on time to the teleconference.

Selection of instructor. The principal instructor for fire support coordination at Quantico agreed to serve as the instructor for the teleconference. Thus the teleconference served not only to bring to nonresident students the experience of interacting with their professional peers, but also to bring to them the expertise of the resident instructional staff of the Education Center.

Selection of equipment. The Education Center requested that the contractor make arrangements to rent the equipment necessary for the teleconference rather than purchasing it (either choice was permitted under the terms of the contract). This decision was intended to avoid the "white elephant" syndrome that sometimes accompanies the introduction of a new method of instruction. The Marine Corps is therefore now free to explore this medium further, if desired, without being restricted to the particular brand and types of equipment selected for this test.

The principal costly device needed to conduct a teleconference is a "bridge" to tie all of the participants together. A bridge costs \$20,000-40,000 to purchase. For this teleconference the contractor utilized the services of a bridging service that charged \$20 per hour per participant.

An additional, optional device is an "audio terminal" for each participant. One form of terminal is simply the standard telephone, and many conference calls in business are conducted with no other receiving/transmitting unit than that. For this teleconference, however, the contractor arranged for each participant to be sent a small speaker and microphone unit of the type designed for small group use around a conference table. One participant already had a "speaker-phone" device at his desk, and he chose to use that device for the teleconference.

The principal advantages of the speaker are permitting hands-free use and avoiding the need to hold a telephone to the ear for an hour or more. The rental of audio terminals cost \$69 for one month, plus shipping to the participant's destination. It should be noted that this type of terminal was more elaborate than needed simply for individual, desk-top use, but that the less expensive types of terminals are not generally available for rent.

Structure of the teleconference. One of the principal characteristics of the resident seminars at Quantico that the teleconference emulated was the breaking of a large class into smaller groups for discussion, then reconvening the larger group to discuss solutions. In the subject of fire support coordination, this method is used to present and discuss fire support "events" -- for example, scenarios in which students take the role of fire support coordinator and tell how they would respond to given calls for fire. Arrangements were made with the bridging service to divide the group of 24 participants into five groups at the direction of the instructor.

Between five and ten minutes were allocated for small-group discussion of each of two fire support events selected for the teleconference. At the end of these periods, the groups were to be reunited with the larger group.

It is important to note that these small groups were composed of officers at distant sites who did not know each other prior to the teleconference, unless incidentally. During the small-group discussion period, then, an officer stationed in Pensacola might be connected over the teleconference bridge to officers in Quantico and Camp Lejeune. To facilitate communication between the members of these small groups, each participant was supplied in advance with a list of all participants and the groups to which they would be assigned.

Scheduling and preparation for the teleconference. The date and time for the teleconference were selected largely on the basis of the instructor's availability. For the sake of simplicity, only sites in the same time zone (eastern) were considered for this test. Although participants had been asked in the original solicitation letter about the best time for them to participate, no consensus was forthcoming in that regard. It is noteworthy that none of the 24 eventual scheduled participants responded to the contractor's letter asking if the proposed date and time were not convenient, and none of the members of the participant pool declined to participate on the grounds of conflict schedule at a particular time.

This point bears emphasis, because scheduling difficulty had been

assumed from the outset to be a potential disadvantage of teleconference in comparison to media such as videotape that permit students to undergo instruction whenever they chose. The teleconference was originally scheduled for 0900 EST, May 17, 1984. For the convenience of the instructor, the time was changed to 1000, apparently without inconveniencing any of the participants.

The contractor recommended the two particular fire support events on the basis that they were similar and would therefore not be too demanding for an audience that had been assembled ad hoc and did not have the benefit of continued attendance at the resident course. The instructor reviewed the contractor's choices, retained one of the two, and substituted an event that he judged more correct in terms of subject matter level.

Several months prior to the teleconference, the contractor arranged for the instructor to participate in a class on how to teach by teleconference, given by a teleconference bridge service (not the service that provided bridge time for the teleconference itself). Several Marine officers joined the instructor in this class, which was itself taught by telephone. Both East Coast and West Coast sites were represented in the class.

Audio terminal equipment was sent to participants and tested in some cases by the contractor's calling up the participant during the week before the teleconference to confirm that the terminal had arrived and was working properly. Several participants reported that they had already performed an "up check" and declined further testing. No cases were reported of

equipment malfunction.

An equipment dry run was conducted for the benefit of the instructor on the day before the teleconference. For this test, the bridging service was used to connect the instructor in Quantico, a member of the contractor's office in California, and two other sites. No problems in transmission or reception were experienced, but there were some differences in volume between different sites. These differences were typical of those experienced with the equipment during the teleconference and typical of those experienced with other equipment sampled prior to the teleconference.

A letter was sent to the bridge service listing the names, telephone numbers, and locations of all teleconference participants, so that the bridge operator would be able to keep the instructor informed as to who was on line and be able to reconnect any participant who "fell off the bridge." The bridge operator was also supplied with the teleconference script so that she could more easily prepare to break the participants into small groups on cue.

The script shown in Appendix B was prepared to guide the instructor in managing the teleconference. (The content of the fire support exercises was based on instruction materials used in the resident course, and were not a part of the script proper, which addressed instead the mechanics of the teleconference, such as how long the introductions would take.) The script was based in large part on a draft prepared by a teleconference consulting firm for the contractor.



A packet was prepared for and sent to each participant, consisting of a 4-page "Teleconference Information Sheet" (see Appendix C), a 12-page review of fire support coordination principles, a 1:50,000 military map of the island of Cyprus, marked by the Supporting Arms Division with fire support coordination lines and other control measures, and the background information and fire support events to be discussed during the teleconference. The content of the packet was based on current Marine Corps doctrinal publications and both resident and nonresident instruction materials. The packet was sent to participants approximately ten days prior to the teleconference.

Conduct of the teleconference. The teleconference was conducted on schedule, beginning at 1000, May 17, 1984. The instructor conducted the teleconference from his office, having set up the audio terminal on a small table next to his desk. Both the contractor and the COTR were in attendance in the instructor's office. A group of interested officers at the Marine Corps Institute listened in to the teleconference. The commanding general of the Education Center was unable to address the participants as planned and as indicated on the instructor's script because of a last-minute scheduling conflict; his place as "welcomer" was taken by a member of the staff of the Amphibious Warfare School.

As already noted above, 23 of 24 participants came on line as scheduled. The teleconference followed the script closely and ended within 90 seconds of 1100. There was not time for additional problems to be presented, which

the instructor had prepared and held in reserve against the possibility that the scheduled activities took less time than expected.

At the conclusion of the teleconference, the instructor invited participants to make any comments they wished, and at least one participant from five of the six groups responded. The following suggestions for improvement were made: (1) more natural interaction (this is taken to mean more like the full-duplex interaction of a regular telephone call), (2) a microphone that was always on and did not have a press-to-talk button, and (3) earphones to cut out background noise. Another participant responded that the speaker, as opposed to earphones, enabled other officers at his unit to listen to the teleconference class, so he preferred the speaker. The sole participant using his own "speaker-phone" device reported that his equipment performed better in his estimation than the other audio terminals.

Instructor's follow-up discussion. Approximately two weeks after the teleconference was held, the contractor distributed to all participants a three-page written discussion of the fire support events that had been drafted by the instructor. The discussion reviewed the facts concerning each event, emphasized the points that the instructor had stressed during the teleconference discussion of the events, and included additional comments. In the same mailing the contractor sent instructions to participants telling them how to return their audio terminals to the company that had shipped them.

#### Step 4. Evaluation of the Teleconference

The day before the teleconference took place, the contractor mailed to each participant a 33-item questionnaire concerning this medium of instruction (see Appendix D). The mailing was timed so that the questionnaire would reach participants as soon as possible after the teleconference, but in no case prior to it. The results of questionnaire analysis are described below.

### Results

The percentage distributions of the responses to each item on the questionnaire were computed and are presented in Appendix D. The items on the questionnaire will be discussed here under three categories: background information, reactions to teleconferencing, and participants' recommendations. Several questions fall in more than one category and will be discussed more than once.

#### Background Information

Background information was collected from items 1,2,4, and 33. Two participants did not return their questionnaires. The sample thus consisted of twenty-one officers, located in six states: North Carolina, Georgia, Virginia, Massachusetts, Florida, and New Jersey. Eight of the officers were aviators, and thirteen were in ground specialties (MOSs).

Twenty of the twenty-one respondents used the audio terminal equipment

supplied through the contractor consisting of a small speaker and a press-to-talk microphone (item 1); 85% of these participants indicated that the quality of the transmission was either good or excellent. In the total sample of 21, 86% of the respondents indicated that the transmission was either good or excellent (item 2).

The majority (57%) of the participants indicated that they spent an hour or more preparing for the teleconference (item 4).

#### Reaction to the Teleconference

Reactions to teleconferencing were recorded on items 3 and 11-31. In general, the reactions to the teleconference were positive. Ninety-one percent of the participants had a favorable overall reaction to the teleconference (item 11) and felt that, in general, it was a good instructional technique (23). Eighty-one percent of the participants indicated that they would like to participate in a similar teleconference in the future (item 12), and 67% indicated that their understanding of fire support coordination had improved as a result of the teleconference (item 13).

Most of the respondents agreed that the teleconference was a better instructional technique than using written material alone (items 14 and 24), but little agreement was found when comparing teleconferencing with classroom lectures (item 25) and films (item 26). Face-to-face group discussions, on the other hand, were generally perceived as easier to conduct, more effective in terms of communication and learning, and providing more

opportunity to participate in discussions (items 27, 28, 29, 16, and 17).

The respondents' descriptions of the strong and weak points of this medium of instruction are consistent with these ratings. The most frequently cited strong point (item 30) was the teleconference's ability to bring together diverse groups and allow them to share their experiences without having to travel to a central location. This feature clearly made the teleconference superior to written materials alone in the eyes of the respondents, but features of teleconferencing such as the limited nature of the exchange (e.g., no visual contact, very structured, time limit, equipment limitations) made the face-to-face group discussion the preferred method for this sample overall.

The most frequently cited weak point of the teleconference (item 31) seemed to be the lack of immediate two-way exchange between participants. However, this feature was not universally seen as negative: as one officer put it, the structure of the teleconference required a participant "to think before he runs his yap."

Most of the officers (85%) felt that the use of small groups stimulated discussion (item 18) and that the written materials supplied to them helped in preparation for the conference (86% -- item 15).

#### Participants' Recommendations

Recommendations from the participants are found on items 5,6,8-10,

19-22, and 32. Seventy-one percent of the respondents suggested that the teleconference should be 90 minutes or more (item 5), and 76% indicated that they felt teleconferences should be a part of the nonresident curriculum (item 8). Of the participants that felt teleconferences should be included in the nonresident curriculum, most (82%) felt that it should be optional (item 9) but done on a monthly basis (67% -- item 10).

Most of the respondents (91%) recommended retaining the small group discussions instead of having only an open discussion with the whole group (item 20), but there was considerable disagreement on whether to include more or fewer events to be discussed (item 21).

The most frequent written suggestions (items for future teleconferences -- item 32) are listed in descending order of frequency below:

- (1) Extend the time of conference.
- (2) Increase the difficulty of material, or at least have all participate at or near the same level of competence with regard to subject matter.
- (3) Allow two-way interchange between participants.
- (4) Allow participants to discuss the subject matter with other participants prior to the teleconference.
- (5) Have smaller groups.
- (6) Have designated leaders or spokesmen for smaller groups.

#### Conclusion

In general, teleconferencing was seen as a positive experience for the officers who participated in this test, although it was not seen as a substitute for face-to-face group meetings.

#### Recommendations

1. To capitalize on the maximum use of resources at resident schools, the instituting of individualized instruction should be considered.
2. Teleconferencing should be considered for those nonresident Navy courses whose participants would benefit from the opportunity to interact professionally with their instructors and peers.

## REFERENCES

Braby, R., Henry, J. M., Parrish, W. F., Jr., & Swope, W. M. A technique for choosing cost-effective instructional delivery systems (TAEG Report No. 16). Orlando, FL: Training Analysis and Evaluation Group, April 1975.

Flaningam, M. R., and Joyner, J. N. Feasibility of individualized instruction for USMC professional military education programs: Phase I. implementation at instructional management school (Special Report 83-19). San Diego, CA: Navy Personnel Research and Development Center, March 1983.

Joyner, J. N., and Sharon, B. Alternative instruction media for nonresident professional military education (Research Product 83-13). Alexandria, VA: Human Resources Research Organization, June 1983.

Joyner, J. N., Vineberg, R., & Flaningam, M. R. Handbook for individualized instruction (Special Report 83-45). San Diego, CA: Navy Personnel Research and Development Center, July 1983.



APPENDIX A

Letter to Students  
Soliciting Participation



APPENDIX A

UNITED STATES MARINE CORPS  
MARINE CORPS INSTITUTE, MARINE BARRACKS  
BOX 1775  
ARLINGTON, VA. 22222

NO REPLY REFER TO

PMED:FCR:mag  
1500

22 NOV 1983

From: Director  
To:

Subj: USMC Professional Military Education Project

Encl: (1) Student Questionnaire

1. The Marine Corps Institute (MCI) and the Marine Corps Development and Education Command (MCDEC) are currently conducting research to enhance Professional Military Education (PME). The intent of this research project is to make available to nonresident PME students a learning experience currently available only to resident students: the conference seminar.
2. The project will include a one hour demonstration test of a telephone conference (teleconference) seminar as a possible method for enhancing the delivery of nonresident PME. The teleconference test will be held between an instructor at the Amphibious Instruction Department (AID) at the Education Center, Quantico, Virginia, and nonresident Amphibious Warfare School (AWS) students. The test will include one or two AID instructors at the Quantico (base) site and a total of thirty-two nonresident students located at various remote east coast CONUS sites. A given remote site may consist of a single student or group of five or more students assembled at locations where larger numbers of officers are assigned.
3. The teleconference, scheduled for March 1984, will be conducted in a manner similar to the conference seminars held in the AWS resident program: students will present solutions to fire support events and these solutions will be discussed by the instructor and by other students located at remote sites from Quantico. Within the teleconference setting the students will have the opportunity to refine their solutions through group discussion and strengthen their decision-making skills.
4. You are being asked to take part in this project. It is requested that the questionnaire at enclosure (1) be completed and returned to MCI by 7 December 1983. This information will be used to plan and conduct the teleconference.
5. In the conduct of this research, we are utilizing the services of a contractor, the Human Resources Research Organization (HumRRO). Please note that all expenses of the teleconference (including long distance charges) are covered by the current research contract and there will be no cost to the participants.

J. M. D. HOLLADAY  
Deputy

APPENDIX B

Instructor's Teleconference Agenda  
and Script

FIRE SUPPORT COORDINATION TELECONFERENCE  
1000 - 1100 EASTERN DAYLIGHT TIME  
MAY 17, 1984

AGENDA

Elapsed Time	
0 - 15 min.	Introduction and roll call of participants by Major Carver  Welcome by Major General Hudson Director, Education Center, MCDEC  Review of handouts and their sequence  Review of agenda
15-22 min.	Small group discussion of Fire Support Event #1
22-30 min.	Presentation of group solutions and discussion of Event #1
30-36 min.	Small group discussion of Fire Support Event #2
36-43 min.	Presentation of group solutions and discussion of Event #2
43-55 min.	Additional fire support problems posed by Major Carver Solutions offered and discussed by entire group
55-60 min.	Wrap up/discussion by Major Carver.
60-75 min.	Post-Teleconference period. The teleconference bridge will remain open for our use for fifteen minutes to allow discussion of the teleconference, the concept of teleconferencing as an instructional tool, and questions from participants.

SMALL GROUP DISCUSSION PROCEDURES

Please follow these steps during small group discussion of the fire support events.

- #1      Use your list of group members to keep track of who has offered his solution and who has not spoken yet.
- #2      If necessary, quickly choose a group leader to keep track of who has spoken and to call on group members.
- #3      Pick one member to report the small group's solution(s) to the main group. Major Carver will call on each group in turn during the discussion portions of the teleconference.

## FIRE SUPPORT COORDINATION TELECONFERENCE

### INSTRUCTOR'S OUTLINE

#### WELCOME

"Welcome to the telephone conference group on Fire Support Coordination.

"This is Major Carver at the Amphibious Instruction Department at Quantico. I'll be your instructor for this one-hour program. Before we begin, is anyone having trouble hearing or understanding me?

(PAUSE AT LEAST 5 FULL SECONDS FOR A RESPONSE)

"Some of you have practiced using the teleconference equipment with Mr. Joyner, the teleconference coordinator. I would like to remind you of four things:

1. First, each time you speak, remember to state your name before you proceed with your question or comment.
2. Second, if you are using a microphone, hold the mike several inches from your mouth and speak directly into it.
3. Third, remember that I can hear only one of you at a time. If you make a comment and no one acknowledges what you said, we probably didn't hear you. Be sure to repeat your comment.
4. Finally, If you are disconnected for any reason, please hang up and wait for the bridge operator to contact you at your number. Mr. Joyner has given the bridge operator telephone numbers for each of you. Is there anyone now speaking from a telephone number different from the one Mr. Joyner has called you on in the last couple of weeks?

(WAIT 5 SECONDS FOR REPLY)

"Teleconference training is a new experience for us all, but I know we can all learn a lot from today's discussion.

## ROLLCALL

"At this time, please reach into your packet of teleconference information and take out the roster listing the name and location of each participant. Follow along as I ask each of you to check in. I suggest that you put a check-mark next to the name of each individual who is on line with us, so that when you have questions later in the discussion, you can address them to the appropriate individual.

"If you have any observers or guests listening in at your location, feel free to introduce them when I call on you, if you like.

- CALL ON THE SITE (QUANTICO) THAT HAS MORE THAN ONE PARTICIPANT.
- WELCOME EACH GUEST/OBSERVER AT QUANTICO.
- INTRODUCE THE FACT THAT OTHER OBSERVERS ARE ON LINE, SUCH AS MAJOR BACON AT MCI AND MAJOR HICKS AT HQMC

AS PEOPLE ARE INTRODUCED, CHECK THEM OFF ON YOUR ROSTER OR ADD THEIR NAMES AS NEEDED. KEEP THE ROSTER NEAR AND PLACE A CHECK NEXT TO THE NAME OF EACH PERSON THAT SPEAKS. THIS HELPS YOU REMEMBER WHO YOU ARE ADDRESSING AND LETS YOU KNOW WHO IS NOT ACTIVELY PARTICIPATING.

THIS IS ALSO THE TIME TO BE SURE THAT YOU CAN HEAR THE PEOPLE AT EACH SITE. FEEL FREE TO TELL PEOPLE TO SPEAK LOUDER AND MORE DIRECTLY INTO THE MICROPHONES.

"The remainder of the receiving sites have only one participant each. The names are listed on the roster in front of you.

(IF THE BRIDGE OPERATOR HAS TOLD YOU THAT ANY OF THE SITES ARE NOT ON LINE, RELAY THIS INFORMATION TO THE GROUP AT THIS TIME.)

"I'd now like the members of Group Alpha to check in:

Captain Budlong?

Captain Curry?

Captain Garrison?

Lieutenant Brilakis?

"Group Bravo:

Captain Eversole?

Captain Fontaine?

Captain Harney?

Lieutenant Hasegawa?

Lieutenant Chase?

"Group Charlie:

Captain Honea?

Captain Ingram?

Captain Kolp?

Captain Rusch?

Captain Wardle?

"Group Delta:

Captain McGrath?

Captain Mitchell?

Captain Pomeroy?

Captain Townsend?

Captain Zeller?

Are there any other guests or observers that have not been introduced or any participants that I am not aware of at this time?

(PAUSE A FULL 5 SECONDS AND WAIT FOR A RESPONSE.)

If not, let us proceed.

"At this time Major General Hudson, Director of the Education Center at Quantico, would like to welcome you.

"General Hudson:

\*\*\*\*\*  
\*\*\*\*\*

"Thank you, Sir.

#### ENCLOSURES

"You should now have in front of you the precourse packet of materials that were mailed to you. For ease of reference the enclosed material should be in the following sequence

1. Agenda
- 2 Description of the fire support events and the map of Cyprus.
3. You have already read the fire support events and given some thought to your own strategy for each problem.

"Does anyone not have these materials in front of him at this time?

(WAIT 5 SECONDS.)

#### AGENDA

"Let's briefly review our agenda for the hour. We have completed the roll call and welcome, and are now on the agenda. As you can see . . .

[we are right on schedule]

or - [we are a little behind schedule so we must move right along].

"We have two events to begin with today. After we have finished with these, I will use the remainder of the hour to pose some additional problems in Fire Support Coordination.



"To discuss the first two events, you have been divided into groups. You each have a roster of those persons assigned to your group.

"Group leaders have not been assigned, but you may do so if necessary when you break into groups the first time. In a few minutes, I will ask the bridge operator to break us into our preassigned groups. At that time she will flip a switch and you will be able to communicate only with those persons in your group.

"During this small group discussion, you will discuss the best solution to event #1. At the end of 7 minutes the bridge operator will reunite the groups and I will call upon various groups to present their solutions.

"We will then utilize this same discussion format for event #2.

"Please note that only 6 or 7 minutes are allotted for each small group discussion. Because of our one hour time constraint we must restrict our discussions to these times.

"You will be receiving a summary letter about 2 weeks from now with an outline of the most appropriate action to be taken for each event.

"Are there any questions before we begin?

(Wait 5 seconds.)

"This is the time to discuss Event #1.

"Bridge operator, will you please break us up into the preassigned small groups and bring us back together in 7 minutes.

(7 MINUTES LATER THE BRIDGE OPERATOR  
WILL NOTIFY YOU THAT ALL GROUPS ARE REUNITED.)

AT THE END OF 7 MINUTES . . .

"Group BRAVO, what action did you take for Event #1?

"Group FOXTROT?

"Group ALPHA?

"Group CHARLIE?

"Group DELTA?

(ASK FOR QUESTIONS AT LEAST ONCE DURING THIS 10 MINUTE DISCUSSION.)

(SUMMARIZE YOUR FINAL SOLUTION.)

"This is the time to discuss Event #2.

"Bridge operator, will you please break us up into the small groups again and bring us back together in \_\_\_\_\_ minutes.

( \_\_\_\_\_ MINUTES LATER THE BRIDGE OPERATOR  
WILL NOTIFY YOU THAT ALL GROUPS ARE REUNITED.)

AT THE END OF \_\_\_\_\_ MINUTES . . .

"Group ALPHA, what action did you take for Event #2?

"Group CHARLIE?

"Group DELTA?

"Group BRAVO?

"Group FOXTROT?

(ASK FOR QUESTIONS AT LEAST ONCE DURING THIS 10 MINUTE DISCUSSION.)

(SUMMARIZE YOUR FINAL SOLUTION.)

\*\*\*\*\* if time permits, pose additional problems \*\*\*\*\*

WRAP UP

"In approximately two weeks you will receive a written summary of the information that we have discussed.

"In about 2 days, you'll receive a course evaluation form. Please complete the evaluation forms as soon as you can. Because we do not have an extremely large number of participants in this teleconference, it is very important that we achieve a 100% return rate on the evaluation forms.

"Thank you for taking part in this new experience and congratulations on a good discussion. This concludes the teleconference on Fire Support Coordination.

"If there are any additional questions or comments about the program that anyone wants to make, the teleconference bridge will stay open until 11:15 this morning. Are there any comments or questions concerning the course content or concerning teleconferencing?

(At conclusion of questions) "Thank you and good bye."

APPENDIX C  
Students' Teleconference  
Information Sheet

## FIRE SUPPORT COORDINATION TELECONFERENCE

### INFORMATION SHEET

The teleconference on fire support coordination is part of an exploratory development project, authorized by the Education Center, MCDEC, at Quantico and funded through the Navy Personnel Research and Development Center (NPRDC) in San Diego. The project has addressed various aspects of Marine Corps Professional Military Education, and the current phase is concerned with nonresident PME only.

One of the aims of the project has been to explore the feasibility of employing "export" media of instruction to enhance the effectiveness of nonresident training. Under contract to NPRDC, the Human Resources Research Organization (HumRRO) produced a report comparing several alternative instructional media for individual nonresident training. Of the various alternatives considered feasible by MCDEC, MCI, and NPRDC, teleconference was selected as the medium to be tested under the current project.

Many possible subjects could be addressed in a teleconference. Fire support coordination was selected because of agreement that this was a very significant area in which further advances in proficiency would be a significant contribution, rather than simply a minor enhancement.

Amphibious Warfare School nonresident students were selected as participants because of the large number of AWS students who have completed the AWS nonresident course or the fire support coordination portion of it during the last year. If teleconferencing proves to be worthwhile, other parts of professional education could be addressed in the future.

### WHAT IS TELECONFERENCING?

As the name implies, teleconferencing permits persons in different locations to be a part of the same telephone call. Teleconferencing has been used a lot in business to facilitate decisions to be made by a group, without the members of the group having to travel to a central location. This saves time and money. Teleconferencing is only now beginning to be tried out extensively for training and education.

Teleconferencing makes use of an electronic "bridge" to tie all the lines together and to regulate somewhat the strength of the signal on each line. For the purpose of this test of the teleconferencing concept, we will be making use of a commercial bridging service. In most teleconferences, participants are also supplied with a speakerphone or speaker and microphone like those shipped to you.

One of the reasons to supply teleconference participants with a "hands-off" speaker and microphone is to reduce annoyance and fatigue associated with holding a telephone handset to the ear for an hour or more. However, most teleconference equipment is still engineered primarily for group sessions around a table. That's why the equipment being shipped to you is relatively bulky by today's standards. One of the things we want to know is how well the equipment worked for you.

### PURPOSE OF THIS TELECONFERENCE

This test teleconference will permit officers enrolled in (or recently graduated from) a PME course to participate in a group problem-solving exercise, as students do in resident PME courses. Because many of the skills taught in PME involve group problem solving or joint decision making, it is considered desirable to explore ways in which the resident "conference group" experience can be exported to the nonresident students.

By conducting this teleconference on fire support coordination, we will be exploring two different aspects of teleconferencing: (1) the concept of teleconferencing as a method of enhancing instruction and (2) the equipment that you will be using to speak and hear during the teleconference. After the teleconference is over, you will receive a questionnaire asking you about your reactions to the teleconference in both of these areas.

### INSTRUCTIONAL OBJECTIVE

The instructional objective addressed by this period of instruction is the following: "Predict FSCC action taken in response to fire support events and relate such response to the principles of fire support coordination."

### INSTRUCTOR

The instructor for the teleconference will be Major Gary Carver. For the last three years, Major Carver has been an instructor with the Supporting Arms Instruction Division of the Amphibious Instruction Department at Quantico. He has taught at the Command and Staff College, the Amphibious Warfare School, and the Communications School in the areas of fire support and coordination.

### "MECHANICS" OF THIS TELECONFERENCE

As mentioned above, one purpose of the teleconference is to reproduce the conditions of a classroom discussion session. The one-hour teleconference will be divided up this way:

1. Introduction by Major Carver and "check-in" of students at different sites
2. Break into small groups (3-8 students) to discuss possible solutions to Fire Support Event #1
3. Small groups "return" to main group (24-30 students) to present their proposed solutions to Fire Support Event #1
4. Break into small groups again (same groups as before) to discuss possible solutions to Fire Support Event #2
5. Small groups return to main group to present solutions
6. (If time permits) additional fire support problems will be offered by Major Carver to the whole group for solution by any student(s) in the group
7. Time for student questions
8. Wrap-up by Major Carver
9. (After 1100 hours) time for additional questions about teleconferencing in general, if desired by any student(s)

One of the restrictions under which the teleconference will operate is that the time allowed for small group discussion must be fixed in advance. This is so the teleconference bridge operator will know when to break apart the large group into smaller groups and when to "rejoin" the groups together. We are planning to give the small groups about 8-10 minutes to discuss each of the fire support events.

Because the fire support events are fairly straightforward, this may be longer than required; but because this is the first time that teleconferencing has been tried out, we are planning conservatively. If discussion moves rapidly during Fire Support Event #1, we will shorten the time for discussion of Fire Support Event #2, if possible, to allow time at the end for additional ad hoc problems.

In any event, there will time toward the end of the hour for students' questions, and there will be further additional time after the teleconference is over if any participants have questions about the teleconference itself.



To permit evaluation of teleconferencing as an instructional tool, the entire teleconference will be recorded, including the small group discussions, through the teleconference bridge device. The contractor will be required to produce a report after the teleconference reporting the results of the questionnaires sent to participants as well as an evaluation of teleconferencing based on analysis of the quantity and ease of group discussion conducted over the phone. The principal question to be answered is: Are group discussions held by telephone similar enough to face-to-face discussions to suggest that teleconference should be developed as a method of enhancing nonresident Marine Corps PME?

#### COST

The cost of the teleconference (renting time on the "bridge," rental of audio speakers and microphones, postage, telephone charges, etc.) are all included in the contract funded by NPRDC. All these charges will be paid through the contractor, HumRRO, as part the contract. There is no cost to participants.

You will be given a specific phone number to use in calling in to the teleconference bridge, and all charges on this number will then be billed to the contractor. You may call HumRRO collect at any time with questions. Funds have been allocated in the contract to cover all such incidental charges, so please don't hesitate to make use of this provision.

You will be given instructions on how to return the rental speakers and microphones without incurring any charge to yourself or your unit. (We may ask you to return all units to HumRRO C.O.D., or we may make an arrangement with Darome to accept C.O.D. shipments in this special case and bill HumRRO. We will let you know which procedure to follow at the end of the teleconference itself or in the letter containing the follow-up questionnaire.)

APPENDIX D

Percentage Distributions of Participants Responding  
to each Question on the Fire Support Coordination Teleconference  
Evaluation Questionnaire (W = 21)

TABLE 1

Percentage Distributions of Participants Responding  
to each Question on the Fire Support Coordination Teleconference  
Evaluation Questionnaire (W - 21)

1. What type of equipment did you use for the teleconference?	
	<u>%</u>
a. telephone alone	0
b. Darome speaker and microphone	95
c. other (please describe)	5
2. How would you describe the quality of the transmission?	
a. excellent	29
b. good	57
c. fair	14
d. poor	0
3. Did you feel you were able to interact as much as necessary with other students?	
a. Yes	57
b. No	43
With the instructor?	
a. Yes	67
b. No	33
4. How much study time was required to prepare for this teleconference?	
a. less than 15 minutes	10
b. 15 to 30 minutes	14
c. 30 minutes to 1 hour	19
d. 1 hour to 2 hours	43
e. more than 2 hours	14
5. Based on this teleconference experience, what do you think the best length for a teleconference of this type would be?	
a. 30 minutes	5
b. 45 minutes	0
c. 60 minutes	24
d. 90 minutes	62
e. longer than 90 minutes	9
6. Can you think of other topics that would be particularly appropriate for a teleconference?	
a. Yes (please list)	48
b. No	14
	38 Missing

7. Do you recall any particular aspects of fire support coordination that you learned about during the teleconference?
- |                      |            |
|----------------------|------------|
| a. Yes (please list) | 48         |
| b. No                | 28         |
|                      | 24 missing |
8. Would you recommend that teleconferencing be made a regular part of the nonresident curriculum for AWS, CSC, etc.?
- |  |           |
|--|-----------|
| a. Yes (If "Yes", please go to question #9)  | 76        |
| b. No (If "No", please skip to question #11) | 19        |
|  | 5 missing |
9. Should teleconferences be an optional part, or a required part, of the nonresident program of instruction?
- |             |    |
|-------------|----|
| a. optional | 82 |
| b. required | 18 |
10. How often should teleconferences be held?
- |                       |    |
|-----------------------|----|
| a. once a month       | 67 |
| b. every two months   | 7  |
| c. every three months | 0  |
| d. every four months  | 13 |
| e. every six months   | 13 |
| f. once a year        | 0  |

For questions #11-#29, please indicate how much you agree or disagree with each statement.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
11. My overall reaction to the teleconference was favorable.	62	29	9	0	0
12. If I had the chance, I would like to participate in similar teleconferences in the future.	52	29	14	5	0
13. My understanding of fire support coordination was improved as a result of the teleconference.	29	38	33	0	0
14. I think my participation in the teleconference will help me retain more subject matter than completing the text alone.	52	28	15	5	0
15. The written materials helped me to prepare for the teleconference.	34	52	14	0	0
16. The extra procedures needed to conduct discussion by teleconference (like stating my name before speaking) slowed down the discussion and made it less effective than face-to-face discussion.	9	44	14	28	5
17. The extra procedures needed to conduct discussion by teleconference gave the discussion more structure and made it more effective than face-to-face group discussion.	0	24	29	33	14
18. The use of small groups during portions of the teleconference helped to stimulate discussion.	52	33	5	10	0
19. The teleconference would have been more effective if there had been more open discussion with the whole group IN ADDITION TO having small group discussions.	15	28	28	24	5
20. The telconference would have been more effective if there had been an open discussion with the whole group only, INSTEAD OF small group discussions.	0	0	9	48	43

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
21. The teleconference would have been more effective with fewer events discussed and more time spent in small group discussions.	5	19	34	38	14
22. The teleconference would have been more effective with more events discussed and less time spent in small group discussions.	5	19	33	43	0
23. In general, I would say that teleconferencing is a good instructional technique.	43	48	9	0	0
24. I learned some things about fire support coordination from this teleconference that I would not have learned from written materials.	29	38	19	14	0
25. I learned some things from this teleconference that I would not have learned from a lecture in a classroom.	19	14	29	33	5
26. I learned some things from this teleconference that I would not have learned from a film.	19	19	38	24	0
27. I learned as much from this teleconference as I would have learned from a face-to-face group discussion.	9	24	14	48	5
28. I found that it was just as easy to have a group discussion on the phone as face-to-face.	9	29	14	43	5
29. I had less opportunity to participate in the discussions during the teleconference than I would have had in a face-to-face group discussion.	10	38	14	33	5

END

1-87

DTIC